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NOTES ON SOME NORTHEASTERN SPECIES OF SPERGULARIA.

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DURING the past summer observations upon *Spergularia* at various stations on the New England coast made it clear, that our ordinary interpretation of specific limits in the maritime species is not entirely satisfactory; and subsequent study of much herbarium material shows that certain of the conclusions of Kindberg based upon the seed-characters of these plants should be sustained. Upon the Atlantic coast of North America there are three very clearly distinguished plants (besides the common *S. rubra*, which is rarely found in saline habitats). One of these plants, with the capsule much longer than the comparatively short round-tipped sepals, and with large seeds, is without doubt *S. canadensis* (Pers.) G. Don, which was based by Persoon upon Michaux's *Arenaria rubra* β from the mouth of the River St. Lawrence. The Michaux material is preserved at the Muséum d'Histoire Naturelle in Paris, and examination of his specimens has confirmed our present interpretation of the species.

The other two maritime plants are passing, in our current manuals, under the name *Spergularia marina* (L.) Griesb., or *Tissa marina* (L.) Britton. Both of them, like *S. canadensis*, may have all the seeds in a capsule wingless or some of them with a thin friable wing; but one of the two plants has the seeds quite smooth (except for the occasional wing), while the other has them glandular-papillose. Although these characters of the seeds have recently been treated as of no diagnostic value, still the plant with papillose seeds has most of the flowers (at least the uppermost) subtended by very short bracts or none at all,

thus giving the upper half of the inflorescence an almost naked appearance. The plant with smooth seeds, on the other hand, has the flowers all subtended by elongate leaf-like bracts which so closely resemble the foliage-leaves as to give the inflorescence the appearance of a series of axillary flowers. In a very large number of American specimens examined, these two characters of inflorescence and seeds appear so regularly concomitant that, although two or three doubtful specimens have been seen, the plants seem to be well-distinguished species. It is not improbable that the intermediate specimens, which are all from one station, are hybrids. In the case of the smooth-seeded plant there seems to be no question as to the name to be taken up. This plant is *Lepigonum leiospermum* of Kindberg, who calls attention to both the seed- and bract-characters. It was based in part upon material from Massachusetts and Pennsylvania, and later transferred to *Spergularia* by F. Schmidt.

The other coastal plant, with papillose seeds and with the upper flowers nearly bractless, although very common, has a most perplexing nomenclatorial history. In 1753 Linnaeus described in the *Species Plantarum* an *Arenaria rubra* β *marina*. A study of the description, citations, and possibly specimens upon which this was based has convinced many European authors that the variety consisted of diverse elements, and so far as we can judge this seems to be true. Authors subsequent to Linnaeus have spent much time and discussion in attempts to make the name apply more definitely to one or the other of these component parts. The results have thus far proved futile, as have the attempts to refer the resulting specific name, *Arenaria marina*, of the early authors to any one species. Therefore, since the name *marina* is one which, as practice shows, has become "a permanent source of confusion or error" the writers feel that intelligibility and clearness in advancing knowledge of the plants themselves will be best served by allowing it to lapse in accordance with Article 51 (4) of the Vienna Code. In so doing they follow Rouy & Foucaud, who say: "La synonymie des noms anciens des *Arenaria* ou *Spergularia media* et *marina* est devenue pour ainsi dire inextricable; aussi estimons-nous, à l'exemple de plusieurs auteurs contemporains, qu'il convient d'abandonner ces noms, qui ne peuvent actuellement que prêter à confusion."¹ Kindberg used for our annual plant with papillose

¹ Rouy et Foucaud, Fl. Fr. iii. 302 (1896).

seeds and with the upper flowers without elongate leafy bracts the name *Lepigonum salinum* based upon *Spergularia salina* J. & C. Presl; and the latter name is taken up in this sense by Gürke¹ and by Druce.² Consequently, in view of the hopeless confusion surrounding the name *marina*, it seems wisest to retain for our annual maritime plant with papillose seeds and aphyllous upper flowers the name *Spergularia salina* J. & C. Presl, which is the earliest name that has been definitely attributed to our plant. In 1843 Griesbach used the name *Spergularia marina* clearly for our plant, but as this was some twenty-four years later than the Presl publication of *S. salina* it need cause no confusion.

One other species of *Spergularia* is known in our eastern flora. This is a plant with thickish, apparently perennial root, long pedicels, larger capsule, and comparatively large seeds with a broad firm persistent and less erose wing. This plant is now rather common about the head of Onondaga Lake in New York, and in the Synoptical Flora of North America and in the 7th edition of Gray's Manual is called *S. media*. It is interesting to note that although this plant is now not at all rare on the shores of Onondaga Lake, it was not known there in 1865. Paine in his "Plants found in Oneida County and Vicinity"³ enumerated no species of *Spergularia*; and Clinton,⁴ in an enumeration of the maritime plants which occur on the saline borders of Onondaga Lake, did not record it. Its subsequent discovery and its present abundance indicate that this species is of recent introduction, and that in this saline region it has become established as have various Old World species which now abound about Boston Harbor.⁵ But that this perennial plant with long pedicels and winged seeds should not be called *Spergularia media* is a conclusion which has been reached by many of those who have specially studied its nomenclatorial status. *Arenaria media* L. has been shown⁶ to consist in part of a *Spergula*, in part of an annual *Spergularia* with papillose seeds (our *S. salina*), and in part of the perennial plant under discussion; and like *Arenaria rubra* β *marina* of Linnaeus it has been subsequently interpreted in so many ways as to become a "permanent

¹ Gürke, *Plantae Europaeae*, ii. 195 (1899).

² Druce, *List of British Plants*, 12 (1908).

³ J. A. Paine in 18th. Ann. Rep. Univ. N. Y. (1865).

⁴ G. W. Clinton in 18th. Ann. Rep. Univ. N. Y. (1865).

⁵ See *RHODORA*, xi. 120, 239 (1909).

⁶ See Hiern, *Journ. Bot.* xxxvii. 319 (1899).

source of confusion or error" and is now so treated by many European authors. Rouy & Foucaud¹ (see quotation above), and Gürke² take up for our plant the name *Spergularia marginata*, (DC.) Kittel, based upon *Arenaria marginata* DC.; Hiern calls it *Alsine marina* Wahlenb. and applies the name *Alsine media* Crantz to *Spergularia salina* J. & C. Presl, although it appears from Hiern's note that Crantz's species (assuming that it has been positively identified) was also a mixture of a *Spergularia* and a *Spergula*. Britten & Rendle³ call it *Alsine marginata* Reichenb. (treating *S. salina* J. & C. Presl as *Alsine media* Crantz); but, in view of the fact that *Spergularia* was included in the list of *nomina conservanda* adopted at Vienna, "a list of names which must be retained in all cases" (Art. 20), we cannot agree with those who throw aside the generic name *Spergularia* for *Alsine* (see Journ. Bot. XLV. 436), a name which itself has been subject to the most diverse interpretation. Druce⁴ treats the perennial *Spergularia marginata* (DC.) Kittel as *S. media* (Pers.) Presl (= *Arenaria media* L. in part), and maintains of *Alsine media* Crantz the name *Spergularia salina* J. & C. Presl. In view of such diversity of interpretation among those who are better situated than the writers to determine the Linnaean type, there seems no clear course open at present but to call the perennial plant with long pedicels and large seeds by the name which leaves no doubt in the mind as to the plant intended, and in so doing to follow a practice which has many adherents in Europe. The first unincumbered name for this plant seems to have been *Arenaria marginata* DC., and as a *Spergularia* the plant should be known as *S. marginata* (DC.) Kittel.

We are inclined to agree with most European authors that the character of pubescence in these saline species is not of much diagnostic value. *Spergularia marginata*, in practically all specimens examined, is glandular-pubescent at least above, and *S. canadensis* is almost as regularly entirely glabrous. In each of the other two species, *S. salina* and *S. leiosperma*, there is a hairy and a smooth form.

The leading characters and distribution of the fleshy *Spergularias* in northeastern North America may be summarized as follows:

Mature capsules large (6.5–9 mm. long), about twice the length of the calyx: pedicels at maturity about twice as long as the capsule: seeds, excluding the

¹ Rouy et Foucaud, Fl. de France, iii. 302 (1896).

² Gürke, l. c. 197.

³ Britten & Rendle, List of British Seed-Plants and Ferns, 7 (1907).

⁴ Druce, l. c.

wing, 0.7–1 mm. long, smooth, all with a broad rather firm scarcely erose wing: stamens 8–10: bracts very short, and inflorescence therefore appearing naked: free portion of the stipules ovate, acuminate: plant with a stout root, seemingly perennial. 1. *S. marginata*

Mature capsules smaller (3–5.5 mm. long): seeds either winged or wingless, often both kinds in the same capsule: margin of the more friable wing strongly erose: stamens 5 or fewer: plants with more slender root, chiefly annual.

Seeds large, 1–1.33 mm. long (exclusive of the wing when present), smooth, rarely papillose: capsule subglobose-ovoid, about twice the length of the calyx: sepals broadly ovate to oblong-ovate, at maturity 1.5–3 mm. long, rounded at tip: free portion of stipules very short, truncate or apiculate: plant glabrous. 2. *S. canadensis*

Seeds smaller, 0.5–0.8 mm. long: capsule conic-ovoid, equaling or a little exceeding the calyx: sepals ovate to lanceolate, obtuse to acutish, at maturity 3–3.5 mm. long: free portion of the stipules long, acuminate: plants glabrous or glandular-pubescent.

Seeds glandular-papillose: upper green bracts of the inflorescence minute or wanting. 3. *S. salina*

Seeds smooth: upper green bracts usually conspicuous.

4. *S. leiosperma*

1. *S. MARGINATA* (DC.) Kittel, Taschenb. Fl. Deutsch. ed. 2, 1004. (1844). *Arenaria rubra* β *marina* L. Sp. Pl. 423 (1753) in part. *A. media* L. Sp. Pl. ed. 2, 606 (1762) in part. *A. marina* All. Fl. Pedem. ii. 114 (1785)? *A. marginata* DC. Fl. Fr. v. 793 (1815). *Lepigonum marinum* Wahlenb. Fl. Gotob. 47 (1820); Kindberg, Monog. Lepig. 18 (1863). *Spergularia media* Presl, Fl. Sic. 161 (1826); Robinson in Gray, Synop. Fl. i. pt. 1, 252 (1897) as to N. Y. plant; Robinson & Fernald in Gray, Man. ed. 7, 379 (1908) as to N. Y. plant. *Alsine marina* Wahlenb. Fl. Suec. pt. 1, 281 (1824); Hiern, Journ. Bot. xxxvii. 319 (1899). *Alsine marginata* Reichenb. Fl. Germ. Exc. 566 (1832). — Saline soil about salt springs near Onondaga Lake, NEW YORK, apparently introduced from Europe. Specimens seen from near Salina (*Fry*, fide Robinson l. c.); near Baldwinsville 1894 (*W. M. Beauchamp*); Syracuse Salt Marsh, August 17, 1901 (*W. W. Rowlee*), August 18, 1902 (*K. M. Wiegand*, No. 27).

2. *S. CANADENSIS* (Pers.) G. Don, Syst. i. 426 (1831), as to synonym but not description. *Arenaria rubra* β Michx. Fl. Bor. Amer. i. 274 (1803). *Arenaria canadensis* Pers. Synop. i. 504 (1805). *Tissa salina* Britton, Bull. Torr. Bot. Cl. xvi. 127 (1889) as to description, not synonym. *Buda borealis* Wats. & Coulter in Gray, Man. ed. 6, 90 (1890). *Tissa canadensis* Britton, Mem. Torr. Bot. Cl. v. 152 (1894). *Spergularia borealis* Robinson in Gray, Synop. Fl. i. pt. 1, 252 (1897). Brackish or saline soils, Gulf of St. Lawrence to Connecticut, most abundant northward; apparently also on the coast of Washington. Among the large number of specimens examined a few may be cited as follows. NEWFOUNDLAND: Frenchman's Cove,

Bay of Islands, August 9, 1896 (*Waghorne*). QUEBEC: Bonne Esperance, August 28, 1882 (*J. A. Allen*); Becscie River, Anticosti, August 31, 1883 (*J. Macoun*, no. 35); Vicinity of Cap à L'Aigle, August 14, 1905 (*J. Macoun*, no. 66,770); Bic, July 25 & 26, 1907 (*Fernald & Collins*, no. 1030). NEW BRUNSWICK: Bathurst, July 25, 1902 (*Williams & Fernald*); Kent County, 1870 (*J. Fowler*). PRINCE EDWARD ISLAND: Brackley Point, August 6, 1888 (*J. Macoun*). NOVA SCOTIA: Purcell's Cove, Halifax Harbor, September 2, 1901 (*Howe & Lang*, no. 1571). MAINE: Carlow Island, Passamaquoddy Bay, August 16, 1909 (*Fernald & Wiegand*); Norwood Cove, Mt. Desert Island, September 18, 1892 (*Fernald*); Wells Beach, July 23, 1898 (*Fernald*). NEW HAMPSHIRE: Hampton, September 22, 1901 (*E. F. Williams*). MASSACHUSETTS: Mystic River Marshes, August 21, 1881 (*F. S. Collins*); North Dennis, July 14, 1879 (*C. N. Brainerd*). RHODE ISLAND: Seekonk River, Providence, July 8, 1892 (*J. F. Collins*). CONNECTICUT: salt marsh, Esker Point, Groton, September 9, 1903, *C. H. Bissell*.

3. *S. SALINA* J. & C. Presl, Fl. čech. 95 (1819); Robinson in Gray, Synop. Fl. i. pt. 1, 251 (1897). *Arenaria rubra* β *marina* L. Sp. Pl. 423 (1753) in part. *A. marina* Roth, Tent. i. 189 (1788) according to Kindberg, Gürke, and Rouy & Foucaud; probably not *A. marina* All. (1785). *Spergularia marina* Griesb. Fl. Rumel. et Bith. i. 213 (1843); Robinson & Fernald in Gray, Man. ed. 7, 378 (1908). *Lepigonum salinum* G. Don in Sweet, Hort. Brit. ed. 3, 69 (1839); Kindberg, Mon. Lepig. 36 (1863). *Tissa marina* Britton, Bull. Torr. Bot. Cl. xvi. 126 (1889). *Alsine media* Hiern, Journ. Bot. xxxvii. 318 (1899), perhaps of Crantz (1766).—Newfoundland and eastern Quebec to Connecticut, and possibly farther southward. Among numerous specimens examined are the following. QUEBEC: brackish gravelly shore, Rivière du Loup, August 2, 1902 (*Williams & Fernald*). NOVA SCOTIA: Baddeck, Cape Breton Island, July 19, 1883 (*Burgess*), Aug. 26, 1898 (*J. Macoun*, no. 19,035); brackish soil, Windsor, August 22, 1902 (*Fernald*). MAINE: old wharf, Pembroke, July 29, 1909 (*Fernald*, no. 1759); Cutler, July 26, 1902 (*Kate Furbish*); Suttons Island, Hancock Co., August 22, 1890 (*E. L. Rand*); site of old pickle factory, North Berwick, September 26, 1897 (*Parlin & Fernald*); Wells Beach, July 3, 1898 (*Kate Furbish*). MASSACHUSETTS: salt marsh, Cambridge, June 1895 (*B. L. Robinson*); salt marsh, Boston, August 2, 1906 (*C. H. Knowlton*); Oak Island, Revere, July 9, 1882 (*H. A. Young*). RHODE ISLAND: Tiverton, September 27, 1903 (*J. M. Greenman*, no. 1765 in part); Seekonk River, September, 1876 (*W. W. Bailey*). CONNECTICUT: Groton Long Point, Groton, September 9, 1903 (*C. H. Bissell*).

4. *S. LEIOSPERMA* (Kindberg) F. Schmidt, Reisen im Amurl. 131 (1868), printed as *Spergula leiosperma* but by its position between two species of *Spergularia* clearly by a typographical error. *Lepigonum*

leiospermum Kindberg, Monog. Lepig. 23 (1863). *Buda marina*, var. (?) *minor* Wats. & Coult. in Gray, Man. ed. 6, 90 (1890). *Spergularia salina*, var. ? *minor* Robinson in Gray, Synop. Fl. i. pt. 1, 252 (1897). *Spergularia salina*, var. *leiosperma* Gürke, Pl. Eur. ii. 196 (1899).—Baie des Chaleurs, Quebec, and Cape Breton Island to Connecticut and southward (Philadelphia and Carolina, *vide* Kindberg); and apparently on the Pacific Coast. The following from among many specimens are cited as characteristic. QUEBEC: damp hollows in gravelly beach, Carleton, July 21, 1904 (*Collins & Fernald*). PRINCE EDWARD ISLAND: beach, Summerside, July 21, 1901 (*J. R. Churchill*). NOVA SCOTIA: Baddeck, Cape Breton Island, July 18, 1883 (*J. Macoun*); near beach, Yarmouth, July 22, 1901 (*Howe & Lang*, no. 24). MAINE: dryish strand, Moose Island, Passamaquoddy Bay, August 16, 1909 (*Fernald & Wiegand*); strand, Pleasant Point, Perry, August 16, 1909 (*Fernald & Wiegand*); pool, Great Cranberry Isle, July 31, 1893 (*J. H. Redfield*); Wells Beach (various collectors). MASSACHUSETTS: Malden, 1867 (*Wm. Boott*); Oak Island, Revere, August 13, 1882 (*H. A. Young*); Cambridge (*Wm. Boott*); shore of "Salt Pond," Eastham, August 16, 1908 (*F. S. Collins*, no. 610); Gay Head, Martha's Vineyard, August 2, 1897 (*S. Harris*). RHODE ISLAND: without definite station, 1844 (*G. Thurber*); Tiverton, September 27, 1903 (*J. M. Greenman*, no. 1765 in part). CONNECTICUT: New Haven (collector unknown); salt marsh, Orange, August 3, 1897 (*C. H. Bissell*, no. 107).

Dwarf plants with very short pedicels and small capsules, etc. were described by Watson as *Buda marina*, var. (?) *minor*, from the Isles of Shoals and adjacent coast of New Hampshire. Similar dwarf plants have been collected on Cape Breton Island. Material collected at Guilford, Connecticut, by Mr. G. H. Bartlett has the bracts of *S. leiosperma* but the seeds papillose as in *S. salina*. This is the only clearly transitional material found in the study of the species.

TERATOLOGY IN TRILLIUM.

WALTER DEANE.

THROUGH the kindness of Mr. Edwin DeMeritte I have been enabled for the third time (See RHODORA, x. 21-24 & 214-216, 1908) to examine and record teratological specimens of the Painted Trillium, *Trillium undulatum* Willd. from his summer camp at Squam Lake, Holderness, New Hampshire. As I have previously stated, these plants were all growing in a very limited area, not more than two meters across "in the leaf-mould and scanty soil on a rocky ridge,"